

**WHAT IS CLAIMED IS:**

1. A mobile communication system for performing handover between heterogeneous mobile communication networks, comprising:

5 a dual-mode terminal having a first module for measuring the strength of a signal received in a first network, and a second module for measuring information of a signal transmitted from a second network if it is determined that the terminal has moved from the first network to the second network, the terminal generating a first SMS (Short message Service) message including the measured signal information ;

10 a first network device located in the first network, for communicating with the first module, receiving the first SMS message from the terminal, and transmitting the measured signal information to the second network device; and

a second network device located in the second network, for communicating with the second module, receiving the measured signal information from the first network device to

15 assign a channel and transmitting channel assignment information to the first network device,

wherein the first network device generates a second SMS message including the channel assignment information and transmits the second SMS message to the dual-mode terminal, and the dual-mode terminal communicates with the second network using the assigned channel.

20 2. The mobile communication system of claim 1, wherein the first module is an asynchronous module for performing communication with asynchronous communication technology and the second module is a synchronous module for performing communication with synchronous communication technology.

25 3. The mobile communication system of claim 2, wherein the first module is a WCDMA (Wideband Code Division Multiple Access) module for UMTS (Universal Mobile Telecommunications System) communication, the second module is a CDMA (Code Division Multiple Access) 1x module for CDMA 1x communication, the first mobile communication network is a UMTS network, the second mobile communication network is a CDMA 1x network,  
30 the first mobile communication network device is a UMTS network device, and the second mobile communication network device is a CDMA 1x network device.

4. The mobile communication system of claim 3, wherein the WCDMA module communicates using a channel assigned by the UMTS network, measures the strength of a signal received from the UMTS network, and has an SMS module for converting corresponding information into an SMS message, wherein the CDMA 1x module communicates using a channel assigned by the CDMA 1x network and measures the strength of a signal received from the CDMA 1x network.

5. The mobile communication system of claim 4, wherein the dual-mode terminal further comprises a mode selector for controlling the WCDMA module and the CDMA 1x module, and comparing the signal strength measured by the WCDMA module with a preset threshold to determine whether the dual-mode terminal has moved from the UMTS network to the CDMA 1x network.

6. The mobile communication system of claim 5, wherein if it is determined that the dual-mode terminal has moved from the UMTS network to the CDMA 1x network, the mode selector controls the CDMA 1x module so that the CDMA 1x module measures the strength of a signal transmitted from the CDMA 1x network, and controls the UMTS module so that the UMTS module transmits measurement information measured by the CDMA 1x module to the UMTS network, wherein the WCDMA module converts the measurement information measured by the CDMA 1x module into an SMS message using the SMS module, and then transmits the SMS message to the UMTS network.

7. The mobile communication system of claim 6, wherein the WCDMA module further converts a channel assignment request signal for performing communication with the CDMA 1x module into an SMS message using the SMS module and then transmits the SMS message to the UMTS network, under the control of the mode selector.

8. The mobile communication system of claim 3, wherein the UMTS network device comprises:

a UTRAN (UMTS Terrestrial Radio Access Network) for setting up a wireless channel

to the dual-mode terminal, communicating with the dual-mode terminal over the wireless channel, and receiving the first SMS message transmitted from the dual-mode terminal;

a core network including an SMS module for restoring the first SMS message that the UTRAN received, and converting information into an SMS message; and

5 a CDMA 1x gateway capable of interfacing with the CDMA 1x network, for transmitting restored data containing one of the measurement information and the channel assignment information to the CDMA 1x network and transmitting the channel assignment information to the core network,

wherein the core network converts the channel assignment information into an SMS  
10 message using the SMS module and transmits the SMS message to the dual-mode terminal via the UTRAN.

9. The mobile communication system of claim 8, wherein the WCDMA module restores the SMS message transmitted from the UMTS network device using the SMS module,  
15 and controls the CDMA 1x module so that the CDMA 1x module can detect the channel assignment information from the SMS message and communicate over an assigned channel.

10. The mobile communication system of claim 3, wherein the CDMA 1x network device comprises:

20 a plurality of base transceiver subsystems (BTSSs) for setting up a wireless channel to the dual-mode terminal and communicating with the dual-mode terminal over the wireless channel;

a base station controller (BSC) for controlling the BTSSs;

a mobile switching center (MSC) connectable to a public switched telephone network (PSTN) interface and the UMTS network and the CDMA 1x network, for assigning a channel to  
25 the dual-mode terminal and transmitting channel assignment information to the UMTS network;  
and

a UMTS gateway for sending a channel assignment request to the MSC by detecting one of the measurement information and the channel assignment request signal transmitted from the UMTS network, and transmitting the channel assignment information received from the  
30 MSC to the UMTS network.

11. The mobile communication system of claim 1, wherein upon receiving the first SMS message, the first mobile communication network device generates channel assignment request information and transmits the channel assignment request information to the second mobile communication network device, wherein upon receiving a channel assignment request  
5 signal, the second mobile communication network device assigns a channel to the dual-mode terminal and transmits channel assignment information to the first mobile communication network device.

12. The mobile communication system of claim 6, wherein the mode selector  
10 compares the strength of a signal received from the UMTS network measured by the WCDMA module to the strength of a signal received from the CDMA 1x network measured by the CDMA 1x module, and determines that the dual-mode terminal has moved from the UMTS network to the CDMA 1x network if the strength of the signal received from the CDMA 1x network is greater than the strength of the signal received from the UMTS network.

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13. A handover method between mobile communication networks using a mobile communication system including a dual-mode terminal having first and second modules capable of performing communication in first and second heterogeneous communication technologies, respectively, for measuring the strength of a signal received by the first module to determine  
20 whether the dual-mode terminal has moved between the mobile communication networks, a first mobile communication network device, located in a first mobile communication network, for communicating with the first module, and a second mobile communication network device, located in a second mobile communication network, for communicating with the second module, the handover method comprising the steps of:

25 a) measuring, by the dual-mode terminal, the strength of a signal transmitted from the second mobile communication network, converting the measurement information into a first SMS (Short Message Service) message, and transmitting the first SMS message to the first mobile communication network device, if it is determined that the dual-mode terminal has moved from the first mobile communication network to the second mobile communication  
30 network according to the measurement information of the received signal;

b) receiving, by the first mobile communication network device, the first SMS message,

restoring data from the first SMS message, and transmitting the restored data to the second mobile communication network device;

c) detecting, by the second mobile communication network device, the measurement information from the data transmitted from the first mobile communication network device,  
5 assigning a channel for performing communication with the second module, and transmitting channel assignment information to the first mobile communication network device;

d) converting, by the first mobile communication network device, the channel assignment information transmitted from the second mobile communication network device into a second SMS message and transmitting the second SMS message to the dual-mode terminal;

10 and

e) receiving, by the dual-mode terminal, the second SMS message, restoring data from the second SMS message, detecting channel assignment information from the restored data, and performing communication with the second module using the assigned channel.

15           14.     The handover method of claim 13, wherein the first module is a WCDMA (Wideband Code Division Multiple Access) module for UMTS (Universal Mobile Telecommunications System) communication and the second module is a CDMA (Code Division Multiple Access) 1x module for CDMA 1x communication.

20           15.     The handover method of claim 14, wherein the first mobile communication network is a UMTS network, the second mobile communication network is a CDMA 1x network, the first mobile communication network device is a UMTS network device, and the second mobile communication network device is a CDMA 1x network device.

25           16.     The handover method of claim 13, further comprising the steps of:  
generating, by the first mobile communication network device, a channel assignment request signal and transmitting the channel assignment request signal to the second mobile communication network device, upon receiving the first SMS message transmitted in step a); and  
assigning, by the second mobile communication network device, a channel to the dual-  
30 mode terminal and transmitting the channel assignment information to the first mobile communication network device, upon receiving the channel assignment request signal.

17. A mobile communication system for handover between heterogeneous mobile communication networks, comprising:

a dual-mode terminal including first and second modules capable of communicating in first and second heterogeneous communication technologies, respectively, for measuring the strength of a signal received from an external communication network, and transmitting measurement information;

a first mobile communication network device located in a first mobile communication network, for communicating with the first module, comparing the measurement information with a preset threshold to determine whether the dual-mode terminal has moved to the external communication network, and transmitting the measurement information to the external communication network if it is determined that the dual-mode terminal has moved to the external communication network; and

a second mobile communication network device located in a second mobile communication network, communicating with the second module, detecting measurement information transmitted from the first mobile communication network device, assigning a channel for performing communication with the second module, and transmitting channel assignment information to the first mobile communication network device,

wherein the first mobile communication network device converts the channel assignment information transmitted from the second mobile communication network device into an SMS (Short Message Service) message and transmits the SMS message to the dual-mode terminal, and the dual-mode terminal receives the SMS message, restores data from the received SMS message, detects the channel assignment information from the restored data, and performs communication with the second module using the assigned channel.

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18. The mobile communication system of claim 17, further comprising a pilot transmitter located in the second mobile communication network device, for transmitting a dummy pilot to the first mobile communication network,

wherein the dual-mode terminal measures the strength of the dummy pilot transmitted from the pilot transmitter and transmits measurement information to the first mobile communication network device.

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19. A handover method between mobile communication networks using a mobile communication system including a dual-mode terminal having first and second modules capable of performing communication in first and second heterogeneous communication technologies, respectively, for measuring the strength of a signal received from the first module, a first mobile communication network device located in a first mobile communication network, communicating with the first module, and a second mobile communication network device located in a second communication network, communicating with the second module, the handover method comprising the steps of:

10 measuring, by the dual-mode terminal, the strength of a signal transmitted from the second mobile communication network device and transmitting measurement information to the first mobile communication network device;

analyzing, by the first mobile communication network device, the measurement information to determine whether the dual-mode terminal has moved to the second mobile communication network;

transmitting, by the first mobile communication network device, the measurement information to the second mobile communication network device if it is determined that the dual-mode terminal has moved to the second mobile communication network;

20 detecting, by the second mobile communication network device, measurement information transmitted from the first mobile communication network device, assigning a channel for performing communication with the second module, and transmitting channel assignment information to the first mobile communication network device;

converting, by the first mobile communication network device, the channel assignment information transmitted from the second mobile communication network device into an SMS (Short Message Service) message, and transmitting the SMS message to the dual-mode terminal; and

receiving, by the dual-mode terminal, the SMS message, restoring data from the received SMS message, detecting channel assignment information from the restored data, and performing communication with the second module using the assigned channel.

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20. The handover method of claim 19, wherein a dummy pilot transmitted from a

pilot transmitter located in the second mobile communication network to the first mobile communication network is the signal transmitted from the second mobile communication network device.

5           21.     A dual-mode terminal capable of performing communication with heterogeneous communication technologies, comprising:

          a first module for performing communication using a channel assigned by a first mobile communication network, measuring the strength of a signal received from the first mobile communication network, and converting corresponding measurement information into an SMS

10 (Short Message Service) message;

          a second module for performing communication using a channel assigned by the second mobile communication network, and measuring the strength of a signal received from the second mobile communication network; and

          a mode selector for controlling the first and second modules according to an assigned  
15 channel, comparing the signal strength measured by the first module with a preset threshold to determine whether the dual-mode terminal has moved from the first mobile communication network to the second mobile communication network, and if it is determined that the dual-mode terminal has moved to the second mobile communication network, and controlling the first module so that the first module converts measurement information of the signal strength  
20 measured by the second module into a first SMS message and transmits the first SMS message to the first mobile communication network,

          wherein if a second SMS message including channel assignment information from the second mobile communication network is received in response to the first SMS message, the mode selector controls the second module so that the second module performs communication  
25 using an assigned channel.

          22.     The dual-mode terminal of claim 21, wherein the first module is an asynchronous module for performing communication with asynchronous communication technology and the second module is a synchronous module for performing communication with  
30 synchronous communication technology.



23. The dual-mode terminal of claim 22, wherein the first module is a WCDMA (Wideband Code Division Multiple Access) module and the second module is a CDMA (Code Division Multiple Access) 1x module.